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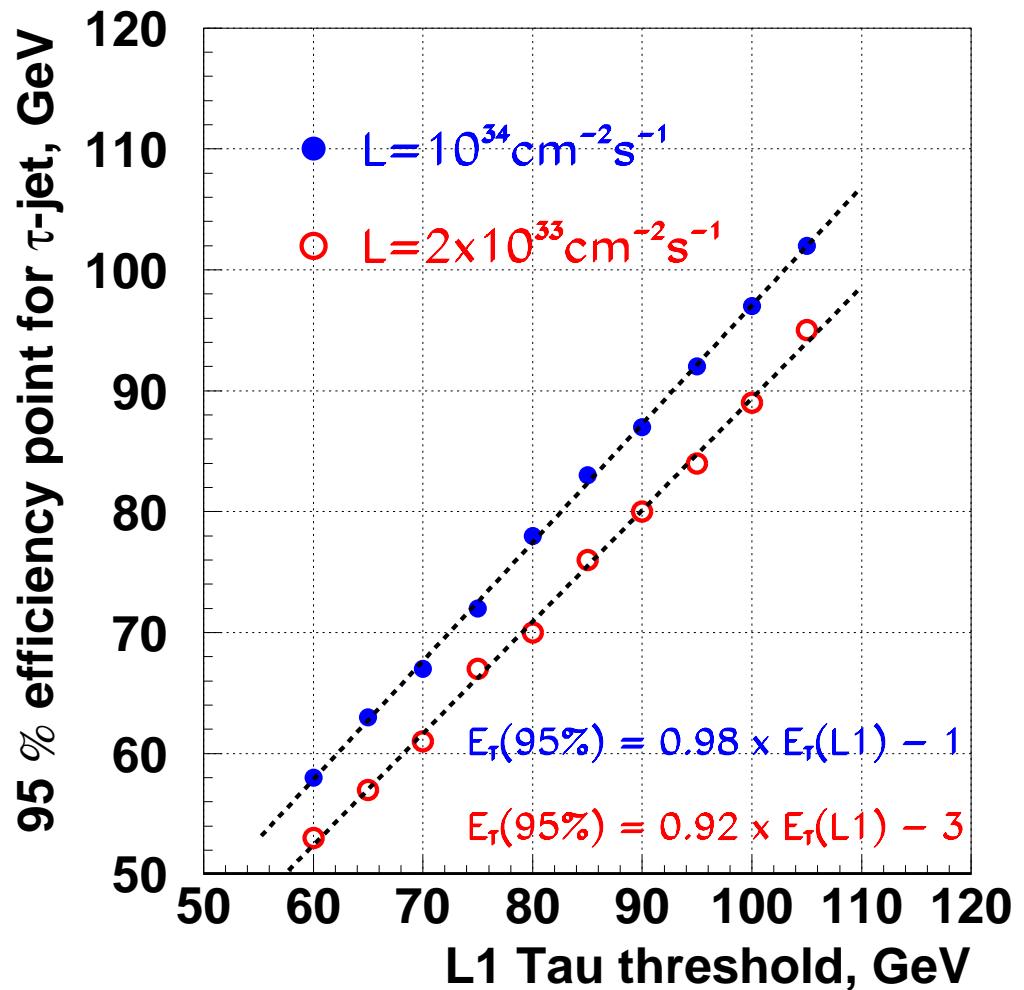
JetMet meeting 31.07.02

L1 Tau thresholds optimization with ORCA6 data

low luminosity

high luminosity

Reminder : L1 Tau scale



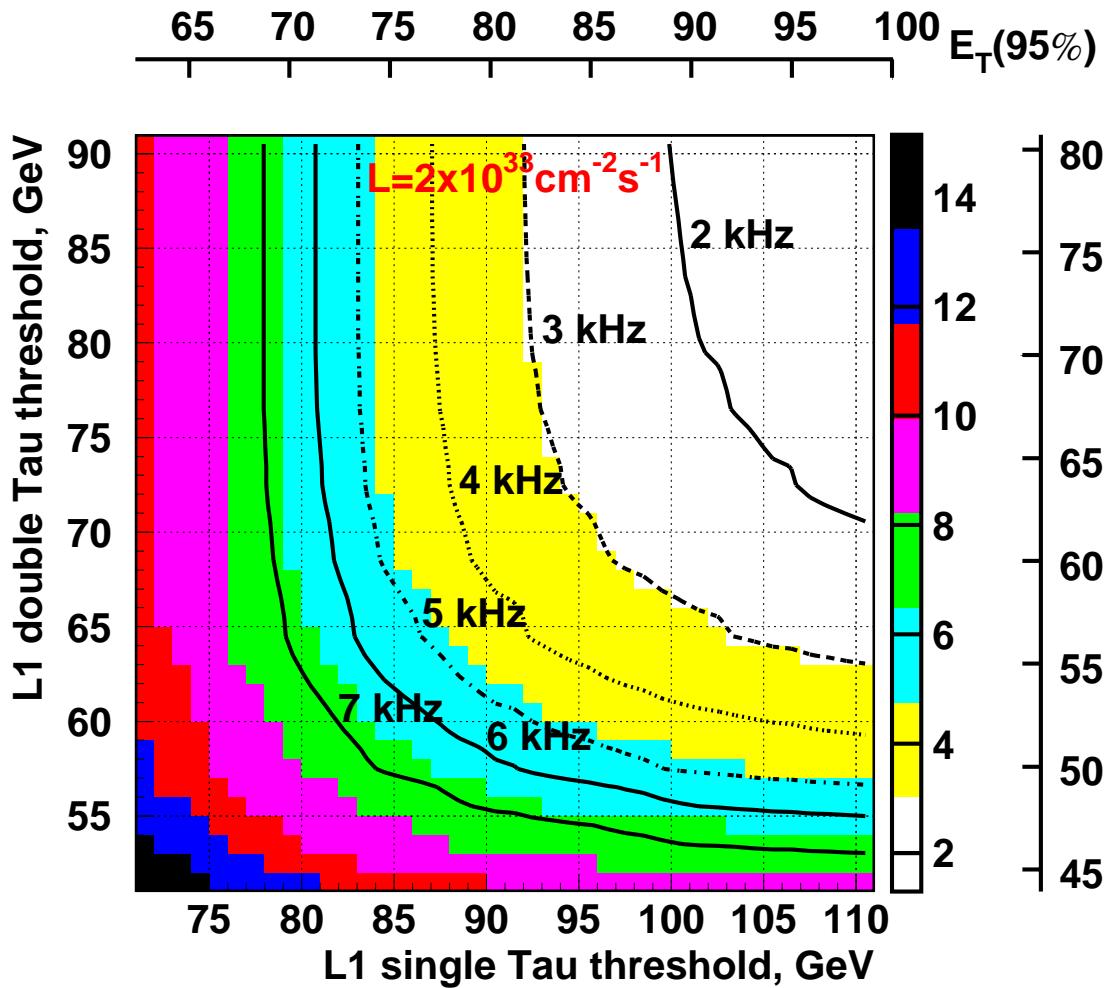
L1 Tau for $H \rightarrow 2\tau \rightarrow 2\text{jet}$ and $H^+ \rightarrow \tau\text{-jet}$ at $L = 2 \times 10^{33} \text{cm}^{-2}\text{s}^{-1}$

efficiency of tau signals at
3.0 kHz L1 rate of 1T or 2T

L1 threshold, GeV		efficiency	
1Tau	2 Tau	$H \rightarrow 2\tau\text{-jets}$ $M=200 \text{ GeV}$	$H^+ \rightarrow \tau\text{-jet}$ $M=200 \text{ GeV}$
110	62	(0.48) 0.75	0.77
105	63	(0.55) 0.76	0.79
100	66	(0.63) 0.78	0.81
95	71	(0.70) 0.78	0.82
93	75	(0.72) 0.77	0.82
92	80	(0.74) 0.76	0.83
91	86	(0.75) 0.76	0.83

number in parenthesis for $H \rightarrow 2\tau$ is efficiency for
single L1 Tau trigger

iso rate curves for qcd bkg.



**individual contributions of qcd p_T bins to the rate of
Lvl-1 1T || 2T for 3 and 6 kHz at $L=2 \times 10^{33} \text{cm}^{-2}\text{s}^{-1}$**

p_T bin, GeV	Rate at $L=2 \times 10^{33} \text{cm}^{-2}\text{s}^{-1}$, kHz	
	Lvl-1 1T > 95 or 2T > 71	Lvl-1 1T > 84 or 2T > 61
20-30	0	0.150 +- 0.067
30-50	0.039 +- 0.019	0.371 +- 0.060
50-80	0.829 +- 0.031	2.504 +- 0.054
80-120	1.469 +- 0.016	2.237 +- 0.018
120-170	0.482 +- 0.004	0.542 +- 0.004
170-230	0.101 +- 0.003	0.106 +- 0.003
230-300	0.022 +- 0.001	0.0236 +- 0.0006
300-380	0.0053 +- 0.0002	0.0056 +- 0.0002
380-470	0.0015 +- 0.0001	0.0016 +- 0.0001
total rate, kHz	2.95 +- 0.04	5.94 +- 0.10
contribution from 50-170 GeV bins	94 %	89 %

red bins are used for tau hlt

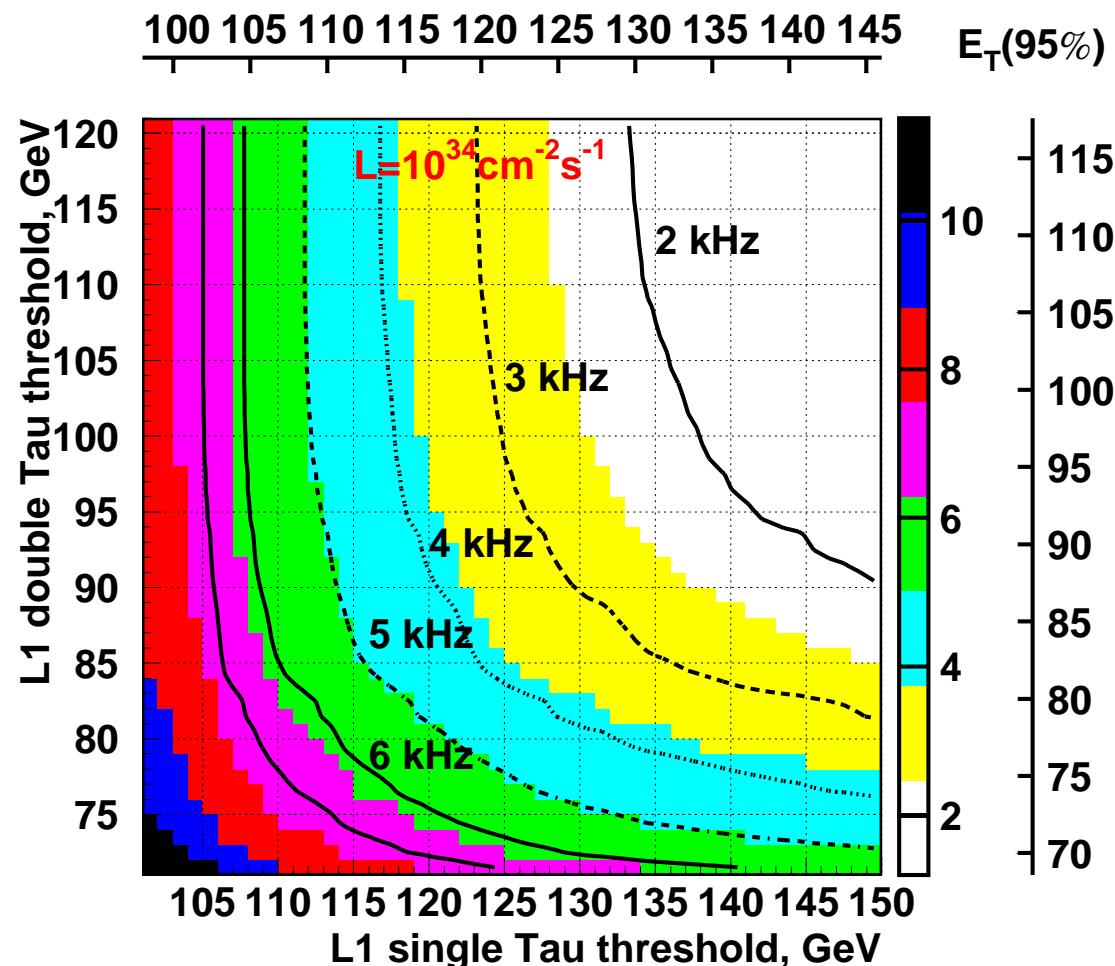
L1 Tau for $H \rightarrow 2\tau \rightarrow 2\text{jet}$ and $H^+ \rightarrow \tau\text{-jet}$ at $L = 10^{34}\text{cm}^{-2}\text{s}^{-1}$

efficiency of tau signals at
3.0 kHz L1 rate of 1T or 2T

L1 threshold, GeV		efficiency	
1Tau	2 Tau	$H \rightarrow 2\tau\text{-jets}$ $M=200\text{ GeV}$	$H^+ \rightarrow \tau\text{-jet}$ $M=200\text{ GeV}$
150	81	(0.05) 0.37	0.36
145	82	(0.06) 0.37	0.40
140	83	(0.08) 0.36	0.45
135	85	(0.11) 0.35	0.49
130	89	(0.15) 0.32	0.54
127	94	(0.19) 0.30	0.57
125	100	(0.21) 0.27	0.59
123	110	(0.23) 0.24	0.61

number in parenthesis for $H \rightarrow 2\tau$ is efficiency for single L1 Tau trigger

iso rate curves for qcd bkg.



individual contributions of qcd p_T bins to the rate of Lvl-1 1T || 2T for 3 and 6 kHz at $L=10^{34}\text{cm}^{-2}\text{s}^{-1}$

p_T bin, GeV	Rate at $L=10^{34}\text{cm}^{-2}\text{s}^{-1}$, kHz	
	Lvl-1 1T > 115 or 2T > 78	Lvl-1 1T > 135 or 2T > 85
20-30	0	0
30-50	0.217 +- 0.082	0
50-80	0.699 +- 0.065	0.188 +- 0.033
80-120	2.816 +- 0.054	1.195 +- 0.036
120-170	1.679 +- 0.018	1.096 +- 0.016
170-230	0.430 +- 0.013	0.380 +- 0.012
230-300	0.098 +- 0.003	0.091 +- 0.002
300-380	0.0230 +- 0.0008	0.0211 +- 0.0007
380-470	0.0064 +- 0.0002	0.0059 +- 0.0002
total rate, kHz	5.97 +- 0.12	2.98 +- 0.05
contribution from 50-170 GeV bins	87 %	83 %

should we worry that 170-230 GeV bin was not analyzed for hlt taus ?
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usage of 50-170 bins gives conservative estimates for L2 Calo+Pxl trigger for taus. > 170 GeV bins addition can only reduce qcd bkg. efficiency at HLT

